

What is claimed is:

- 1 1. A driving apparatus for receiving an input voltage
2 at an input terminal and generating an output voltage at an
3 output terminal, comprising:
4 an output buffer electrically coupled between the input
5 and output terminal; and
6 an operational amplifier electrically coupled between
7 the input and the output terminal, and
8 selectively turned on to drive the output voltage
9 to a voltage level substantially the same as the
10 input voltage.
- 1 2. The driving apparatus as claimed in claim 1,
2 wherein the operational amplifier is turned off when a level
3 of the input voltage is higher than a predetermined
4 threshold.
- 1 3. The driving apparatus as claimed in claim 1,
2 wherein the operational amplifier is turned off when a level
3 of the input voltage is lower than a predetermined
4 threshold.
- 1 4. The driving apparatus as claimed in claim 1,
2 wherein the output buffer comprises:
3 a bias circuit activated during a first period to
4 generate bias voltages; and
5 a source follower activated and biased by the bias
6 voltages during a second period after the first
7 period, and inactivated during a third period
8 after the second period.

1 5. The driving apparatus as claimed in claim 4,
2 wherein the operational amplifier is turned on during the
3 third period.

1 6. The driving apparatus as claimed in claim 4,
2 wherein the operational amplifier is turned on during a part
3 of the second period.

1 7. The driving apparatus as claimed in claim 4,
2 wherein the output buffer further comprises a short circuit
3 for selectively shorting the input terminal and the output
4 terminal.

1 8. The driving apparatus as claimed in claim 7,
2 wherein the short circuit is activated during a fourth
3 period after the third period.

1 9. The driving apparatus as claimed in claim 1,
2 wherein the operational amplifier is an unit gain
3 operational amplifier.

1 10. A driving apparatus for receiving an input voltage
2 at an input terminal and generating an output voltage at an
3 output terminal, comprising:
4 an output buffer receiving the input voltage and
5 pulling the output voltage up to a first level
6 higher than the input voltage during a first
7 period; and
8 an operational amplifier electrically coupled between
9 the input and the output terminal, and
10 selectively turned on to pull the output voltage

11 down to a second level substantially the same as
12 the input voltage during a second period after
13 the first period.

1 11. The driving apparatus as claimed in claim 10,
2 wherein the operational amplifier is turned off when a level
3 of the input voltage is higher than a predetermined
4 threshold.

1 12. The driving apparatus as claimed in claim 10,
2 wherein the operational amplifier is turned off when a level
3 of the input voltage is lower than a predetermined
4 threshold.

1 13. The driving apparatus as claimed in claim 10,
2 wherein the output buffer comprises:
3 a bias circuit activated during a third period before
4 the first period to generate bias voltages; and
5 a source follower activated and biased by the bias
6 voltages during the first period.

1 14. The driving apparatus as claimed in claim 13,
2 wherein the output buffer further comprises a short circuit
3 for selectively shorting the input terminal and the output
4 terminal.

1 15. The driving apparatus as claimed in claim 14,
2 wherein the short circuit is activated during a fourth
3 period after the second period.

1 16. The driving apparatus as claimed in claim 10,
2 wherein the operational amplifier is an unit gain
3 operational amplifier.

1 17. A driving apparatus for receiving an input voltage
2 at an input terminal and generating an output voltage at an
3 output terminal, comprising:
4 an output buffer receiving the input voltage and
5 pulling the output voltage down to a first level
6 lower than the input voltage during a first
7 period; and
8 an operational amplifier electrically coupled between
9 the input and the output terminal, and
10 selectively turned on to pull the output voltage
11 up to a second level substantially the same as
12 the input voltage during a second period after
13 the first period.

1 18. The driving apparatus as claimed in claim 17,
2 wherein the operational amplifier is turned off when a level
3 of the input voltage is lower than a predetermined
4 threshold.

1 19. The driving apparatus as claimed in claim 17,
2 wherein the operational amplifier is turned off when a level
3 of the input voltage is higher than a predetermined
4 threshold.

1 20. The driving apparatus as claimed in claim 17,
2 wherein the output buffer comprises:

3 a bias circuit activated during a third period before
4 the first period to generate bias voltages; and
5 a source follower activated and biased by the bias
6 voltages during the first period.

1 21. The driving apparatus as claimed in claim 20,
2 wherein the output buffer further comprises a short circuit
3 for selectively shorting the input terminal and the output
4 terminal.

1 22. The driving apparatus as claimed in claim 21,
2 wherein the short circuit is activated during a fourth
3 period after the second period.

1 23. The driving apparatus as claimed in claim 17,
2 wherein the operational amplifier is an unit gain
3 operational amplifier.